Finschia—A Genus of "Nut" Trees of the Southwest Pacific

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INTRODUCTION

A PLANT FAMILY with a most interesting and intriguing distribution is Proteaceae, which finds its greatest development in Australia (650 species) on the one hand and South Africa (300 species) on the other, though the two countries have no genera in common. Practically all the South African species and the vast majority of Australian ones are markedly xerophytic. The largest genus, *Grevillea* R. Br., consists mainly of xerophytic shrubs or small trees but a few are large trees found in the rain forests of tropical and subtropical eastern Australia, New Guinea, and New Caledonia. In the southwest Pacific area the family finds its greatest development in northeastern Australia, where trees belonging to it provide the great bulk of cabinet timbers known in the trade as "Silky Oaks." There is close affinity between the Proteaceae of eastern Australia and of western South America as illustrated by the genera *Embothrium* Forst. which has four species in South America, two in Australia, and one in New Guinea, and *Lomatia* R. Br. which has four species in South America and eight in Australia. The endemic Australian genus *Telopea* R. Br. is separated from *Embothrium* Forst. on very slender grounds, and Diels (1916: 200), with some doubt, records the genus *Euplassa* Salisb., otherwise consisting of eight South American species, as Papuan and Australian (one species each).

An outstanding feature of the flora of the rain-forest belt of northeastern Australia is the number of monotypic or very small genera of Proteaceae developed in it, e. g., *Austromuellera* C. T. White, *Buckinghamia* F. Muell., *Cardwellia* F. Muell., *Carnarvonia* F. Muell., *Darlingia* F. Muell., *Hollandaea* F. Muell. (two spp.), *Musgravea* F. Muell., and *Placospermum* White & Francis. A surprising feature is the absence, with the exception of one species in New Zealand, of the family from Polynesia.

There is in the islands of the southwest Pacific—Caroline Islands, New Guinea, Solomon Islands, and the New Hebrides—a group of trees with the floral characters of *Grevillea* R. Br. and the fruit of *Helicia* Lour. These, I consider, all belong to *Finschia* Warb. This genus was founded by Warburg (1891: 297) on a tree from northeastern New Guinea. His original description would cover *Grevillea* R. Br. exactly though he does not mention this genus and on the following page the distinctions he gives for separating his proposed new genus from *Helicia* are exactly those which distinguish *Grevillea* from that genus. H. Sleumer (1939: 127), in a more recent contribution to our knowledge of Papuan Proteaceae, includes *Finschia* Warb. in *Grevillea* R. Br. and gives a key to the New Guinean species. Lauterbach (1913: 329), in a key to the Papuan genera of Proteaceae, distinguishes *Finschia* Warb. from *Grevillea* R. Br. by the fruit being scarcely dehiscent. Later Diels (1916: 205), in an account of new Papuan Proteaceae, referred to this and stated that Lauterbach's conclusions were unfounded as fruits of neither *F. rufa* Warb. nor *F. chloroxantha* Diels, the only two species so far described, were known. An emended description of the genus and a key to the species are offered here, a new species is described, and a new combination proposed.

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Finschia Warburg
(Emended description)

Flowers hermaphroditic. Petals (perianth segments) curved and united in the bud stage, soon free. Anthers sessile or nearly so within the concave laminae or tips of the petals, connective broad, not produced beyond the anther cells, anther cells slightly divergent towards the base. Torus oblique. Hypogynous gland fleshy, entire, horseshoe-shaped or nearly annular; ovary stipitate, style slender or narrowly clavate, usually long and protruding from the split on the lower side of the perianth tube in the later bud stage. Fruit an indehiscent drupe; exocarp thin, fleshy; endocarp bony, rough; cotyledons 2, thick and fleshy and filling the seed. Trees, trunk buttressed, often raised on stilt roots. Leaves entire. Inflorescence racemose, racemes axillary or on the older wood below the leaves.

Type species: *F. rufa* Warb. (1891: 297).

Four species in the rain forests of Micronesia (Caroline Islands), New Guinea, Solomon Islands, and the New Hebrides.

Key to the Species

Leaves densely rufous- or ferruginous-pubescent beneath.
- Leaves 28–35 cm. long, 11–13 (to 17) cm. wide; inflorescence to 40 cm. long . . . . . 1. *F. rufa*
- Leaves 18–25 (to 28) cm. long, 6–9 cm. broad; inflorescence 24–26 cm. long . . . . . 2. *F. Carrii*

Leaves glabrous.
- Flowers very densely ferruginous-pubescent; fruit globose, not laterally compressed, over 4 cm. diam. . . . . 3. *F. ferruginiflora*
- Flowers thinly ferruginous-pubescent in the bud stage, almost glabrous when fully developed; fruit laterally compressed, not above 4 cm. diam. . . . . 4. *F. chloroxantha*

In the following account of the species the letters B.S.I.P. and N.G.F., preceding the collectors' numbers, stand for British Solomon Islands Protectorate and New Guinea Forests, respectively. The first precedes all specimens collected in the Solomon Islands by F. S. Walker and myself in 1945–1946 and the latter those made in New Guinea under the direction of Major J. B. McAdam, C.R.E., New Guinea Forests, by officers and men of his unit headquarters and two associated forest survey companies.

1. **Finschia rufa** Warburg (1891: 298)
Grevillea rufa (Warburg) Sleumer (1939: 128).

Tree. Leaves large, coriaceous, shortly petiolate, apex obtuse or rotundate, base acuminate, entire, adult leaves glabrous above, the midrib and main nerves rather prominent, rufous- or ferruginous-tomentose beneath, the midrib, lateral nerves, and the veins very prominent, lateral nerves about 20 on each side of the midrib, not markedly curved, joined below the margin and united with an intramarginal vein close to the edge; blade 25–35 cm. long, 11–13 (to 17) cm. wide; petiole 2 cm. long. Racemes 17–40 cm. long; rachis, pedicels, and flowers densely clothed with red-brown hairs (rufous-villous). Flowers solitary or in pairs, pedicels 1 mm. long; petals (perianth segments) about 1 cm. long, glabrous on the inner face; ovary stipitate, seated obliquely on a 3-mm. long stipes, style 7 mm. long; torus oblique, hypogynous gland annular or nearly so. Fruit unknown.

Northeast New Guinea: Only known from the neighbourhood of Sattelberg where, according to Sleumer, *loc. cit.*, it has been collected several times. *(Warburg 20496,* type: *Hellwig 531, Clemens 2234* and *8094 A.)*

Unfortunately I have not seen specimens and the above description is drawn from that of the author's original and from the few notes in Sleumer's key. According to Warburg, the pedicels are only 1 mm. long, which would give the inflorescence almost a spicate appearance which, apart from the larger leaves, should distinguish it from the next species.

2. **Finschia Carrii** (Sleumer) C. T. White *comb. nov.*
Grevillea Carrii Sleumer (1939: 128).

Tree, about 12 m. high, branchlets densely

FIG. 1. *Finschia ferruginiflora* C. T. White. New Guinea: *L. S. Smith 1093* (flowers) and *1060* (fruits). A, flower (slightly enlarged); B, gynaeceum (slightly enlarged); C. fruit.

rufous- or ferruginous-pubescent. Leaves narrowly obovate, apex rounded, base cuneate, chartaceous, glabrous above except for the midrib; lateral nerves from 14 in the smaller leaves to 24 in the larger ones on each side of the midrib, united to form a strong intramarginal vein 4–5 mm. from the edge with a finer less distinct one very close to the margin, slightly raised, connecting veins and veinlets clearly discernible in the dried specimens, densely rufous- or ferruginous-pubescent beneath, lateral nerves and connecting and reticulate veinlets raised and prominent; blade 13–28 cm. long, 6–9 cm. wide, petiole densely tomentose, 1.5–3 cm. long. Racemes mostly on the older wood below the leaves, very densely flowered, 24–30 cm. long including the short peduncle; rachis, pedicels, and flowers densely rufous- or ferruginous-tomentose; pedicels in pairs, slender, 4–5 mm. long. Petals (perianth segments) 7–8 mm. long, glabrous on the inner face, ovary densely clothed with rather long reddish hairs, stipitate; stipes glabrous, style glabrous, grooved, gradually thickened towards the top; stigma pyramidal; hypogynous gland very prominent, entire, horseshoe-shaped or almost annular.

Southeast New Guinea: Koitaki, alt. *ca.* 1,500 ft. in rain forest, *C. E. Carr No. 12058* (fls.), April, 1935 (tree 12 m.; fls. golden-yellow, tipped brownish-orange, style bright yellow-green, stigma deep green).

Though fruits are unknown, I have transferred this to *Finschia* Warb. owing to its close relationship to *F. rufa* Warb., from which it differs chiefly in being smaller in all its parts. The description has been drawn mainly from isotype material but a few notes from Sleumer's original description have been incorporated mainly to give variation in size of leaf and a few other characters. The species is known only from the type gathering.

3. **Finschia ferruginiflora** *sp. nov.*

Fig. 1

Arbor 30 m. alt., trunco per radices adventitios ad 1.5 m. altos supra terram elevato, cortice bruneo lenticellarum rimis notato, ramulis validis, partibus novellis ferrugineis mox glabris. Folia utrinque glabra, anguste obovata, apice rotundata, basi cuneata in petiolum validum angustata, chartacea, nervis lateralibus primariis utrinsecus 18–20, utrinque prominentibus, in venam intramarginalem 4–5 mm. a margine arcuatim confluentibus, venulis in sicco laxe reticulatis supra parum subtus distinctius elevatis; lamina 14–22 cm. longa, 3.5–5 cm. lata; petiolus 1–1.5 cm. longus. Racemi densiflori, axillares, saepe ex axillis foliorum delapsorum orti, breviter pedunculati, cum pedunculo 13–18 cm. longi, cum floribus pilis ferrugineis densissime obsiti; pedicelli graciles, ca. 1 cm. longi; torus obliquus, glandula hypogyna integra hippocrepiformi; petala (perianthii segmenta) 7–8 mm. longa; pistillum 1.2 cm. longum, ovario unilaterali fusco-piloso stipitato, stipite cum stylo glabrescenti. Fructus indehiscens, globosus, ca. 5 cm. diam., fere vel omnino sessilis, pericarpio tenui, endocarpio osseo 7–8 mm. crasso, sutura visibili sed indistincta.

Northeast New Guinea: Kuminkira, Aiyura, alt. about 5,000 ft., *L. S. Smith N.G.F. 1093* (Type: flowers) October, 1944 (tree 100 ft., with adventitious roots up to 4.5 feet above the ground; bark brownish, slightly dotted with pustular lenticels, very finely longitudinally cracked with a few small corky scaled patches; flowers rusty brown, style green with green stigma). Bracken Ridge, Aiyura, alt. about 6,000 ft., *L. S. Smith N.G.F. 1060* (fruits) October, 1944 (tree 100 ft., trunk raised on adventitious roots up to 3 feet above the ground; bark brownish with small pustular lenticels sometimes arranged in short longitudinal rows; fruits globular, brownish; seeds cooked and eaten by the natives).

4. **Finschia chloroxantha** Diels (1916: 204)

Figs. 2, 3

Grevillea densiflora C. T. White (1922: 25); H. Sleumer (1939: 129).

Grevillea elaeocarpifolia Guillaum. (1932: 87).

FIG. 2. *Finschia chloroxantha* Diels. Bougainville: *S. F. Kajewski 2033.*

Helicia micronesica Kanehira (1933a: 95, fig. 23 [fol. fruct.]; 1933b: 669; 1935: 311).
Finschia micronesica (Kanehira) Kanehira (1938: 241, fig. 72 [fl.]).
Finschia Waterhouseana B. L. Burtt (1936: 465).
Grevillea micronesi(a)ca (Kanehira) Sleumer (1939: 129).
Finschia densiflora (C. T. White) C. T. White (ex Walker, 1948: 155).

Tree up to 25 m. high, trunk buttressed, often raised on stilt roots; bark grey to light brown, usually marked with pustules in longitudinal lines; young parts densely clothed with a tawny or ferruginous pubescence. Leaves lanceolate, elliptic or narrowly obovate ("oblanceolate"), apex acute or blunt, base cuneate, in the dried state dull or nitid above; main lateral nerves from about 12 on each side of the midrib in the smaller leaves to about 30 in the larger ones, arching to form an intramarginal vein, sometimes very distinct, at others not very clearly defined; blade variable in size, 9–40 cm. long, 3.5–13 cm. wide; petiole 1–2.5 cm. long. Racemes many flowered, axillary or more frequently on the older wood below the leaves, rachis pubescent, to 30 cm. long, including the comparatively short peduncle. Flowers yellow-green to orange-yellow, pedicels and petals (perianth segments) thinly clothed with a few scattered brown hairs; pedicels 0.3–1 cm. long; petals 0.4–0.8 cm. long. Ovary glabrous, stipitate, stipes to 0.5 cm. long; style narrowly clavate, to 1.5 cm. long; torus very oblique, hypogynous gland prominent, entire, horseshoe-shaped or nearly annular. Fruit yellow, compressed, oblique, 3–4 cm. long, 2.5–3 cm. wide, and 2.5 cm. deep; endocarp bony, roughened; seed edible.

A very widely spread species from the Caroline Islands in the north through New Guinea and the Solomon Islands to the New Hebrides in the south. To the specimens cited by the authors quoted above the following can be added:

Northeast New Guinea: Heath Island, Open Bay (nr. New Britain), in rain forest on volcanic soil, *K. Mair, N.G.F. 1878* (flowers) May, 1945 (tree 60 ft., stilt-rooted to 2 ft. 6 in.; bark light brown with pustules in longitudinal lines; flowers yellow-green). Solomon Islands: New Georgia Group, Kolombangara Island, in lowland rain forest, *F. S. Walker & C. T. White B.S.I.P. 183* (leaves and seeds from under the tree) October, 1945 (tree 70 ft., buttresses supporting the trunk off the ground on stilt roots 6 ft. high; bark grey-brown, roughened with numerous fine pustular lenticels; seeds with an edible, pleasantly flavoured kernel).

It is with some hesitation that I have united all the species quoted above with *F. chloroxantha* Diels, especially as Sleumer *(loc. cit.)*, who had the opportunity of seeing the type of this species, kept it distinct from the others. Knowing, however, the extreme variability of many of the Proteaceae, especially when they are brought into cultivation, I have after considerable thought decided to regard *F. chloroxantha* Diels as a "formenkreis" species with several geographical races. It seems to differ from subsequently named species only in the larger leaves and longer inflorescences.

Sleumer *(loc. cit.)* suggested that *Grevillea elaeocarpifolia* Guillaum. was identical with *Grevillea densiflora* C. T. White but did not actually synonymise the two species. Kajewski when in Bougainville, according to his field labels, recognized the tree there as practically identical with the one in the New Hebrides. In this latter area he mentions that the trees are frequently seen about villages and appear to be planted as the seed is quite an important food nut. The New Hebrides tree which was aptly named by Guillaumin (1932) as *Grevillea elaeocarpifolia,* judging from Kajewski's material (two numbers), seems to have consistently smaller leaves, but this is an extraordinarily variable feature in the New Guinea tree of which I have seen a good range of specimens.

Finschia micronesica Kanehira, according to the author's description and illustrations, seems to differ in the inflorescence being much shorter

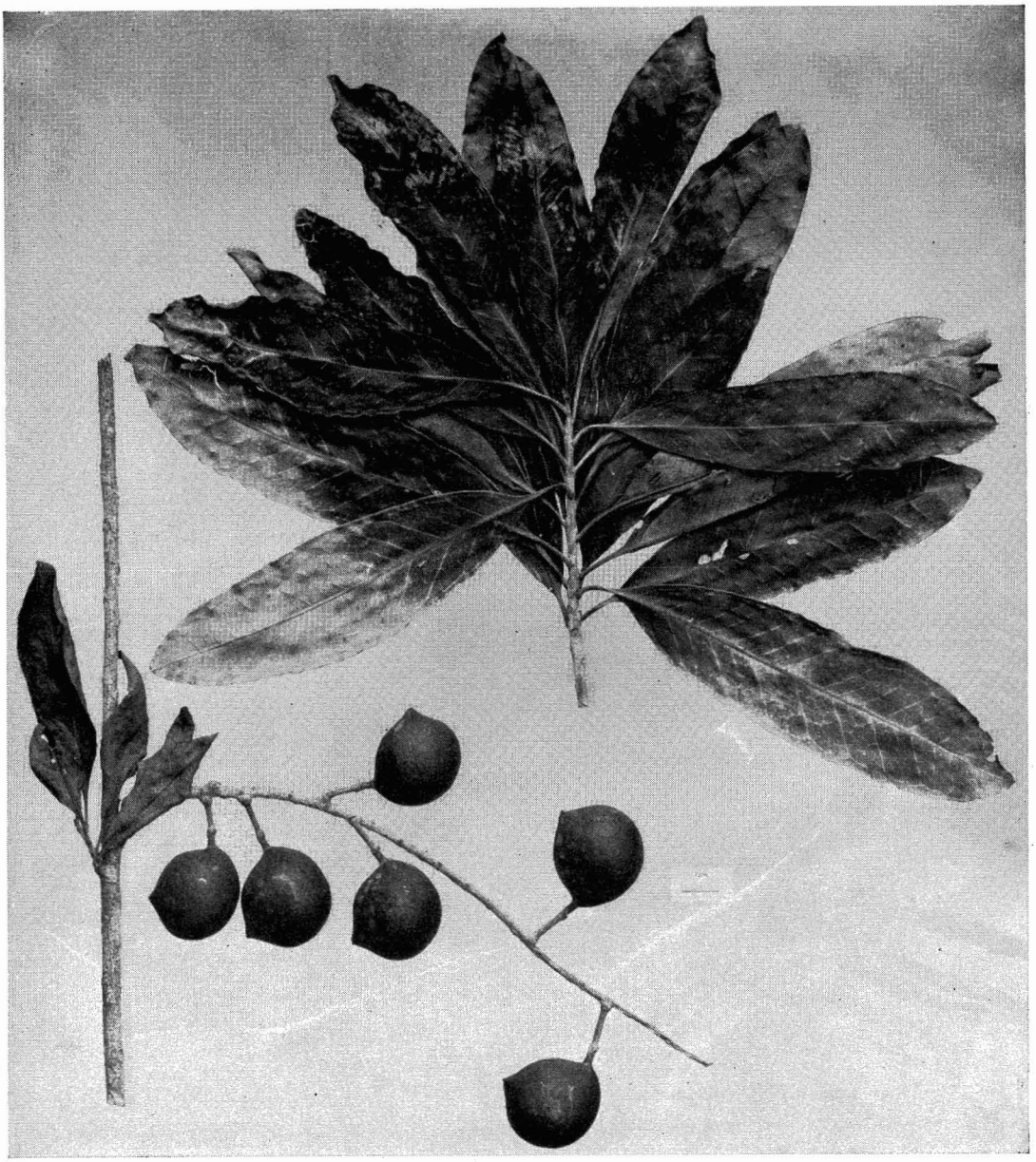

FIG. 3. *Finschia chloroxantha* Diels (*Grevillea elaeocarpifolia* Guillaumin). New Hebrides: *S. F. Kajewski 350.*

with fewer, less crowded flowers and in the fruits being slightly larger than in the New Guinea, Solomon Islands, and New Hebrides trees, but it is doubtful if these are points of specific value.

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